REMARKS

In the Office Action, the Examiner noted that claims 1-13 are pending in the application, and that claims 1, 4-7, 9, 12, and 13 are rejected under 35 U.S.C. §103. The Examiner further noted that the objection to the drawings has been withdrawn since amended drawings were submitted in the response dated March 8, 2004. The Examiner further noted that the earlier rejections to certain claims under 35 USC §112, 2nd paragraph, have been withdrawn. The Examiner noted allowable subject matter as follows: claim 11 has been allowed; claims 2, 3, 8, and 10 have been objected to as being dependent upon a rejected base claim and would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims.

By this response, Applicants have amended claims 2, 3, 8, and 10 to be in independent form including all the limitations of the base claim and respective intervening claims. In view of the amendments above and the discussion that follows, Applicants submit that this application is in condition for allowance.

I. ALLOWABLE SUBJECT MATTER

Claims 2, 3, 8, and 10 have been objected to as being dependent upon a rejected base claim. It was noted that these claims would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. Accordingly, Applicants have amended claims 2, 3, 8, and 10 to be in independent form including all the limitations of the base claim and any intervening claims. In particular, claims 2 and 3 have both been amended to include separately all the limitations of base claim 1. Claim 8 has been amended to include all the limitations of base claim 1 and the limitations present in intervening claim 7. Claim 10 has been amended to include all the limitations of base claim 9. In view of the amendments to the claims, it is respectfully submitted that amended independent claims 2, 3, 8, and 10 are now allowable.

II. REJECTION OF CLAIMS UNDER 35 U.S.C. §103(a)

A. Rejection over Bustini in view of Galand

The Examiner has rejected claims 1, 4, 5, 6, 7,and 12 as being unpatentable over U.S. Patent 5,313,454 to Bustini (hereinafter referred to as "Bustini") in view of 5,838,922 to Galand. (hereinafter referred to as "Galand"). The rejection is respectfully traversed.

Applicants have defined in claim 1 a method that involves the steps simply of assigning a priority level, transmitting upstream a feedback value, and transmitting downstream only packets meeting a condition imposed by the feedback value. The method is performed all within the confines of a portion of a network defined in the claim. This network involves the sending node X_ℓ, the receiving node R_ℓ, and the link l between the specified sending node and the specified receiving node. In claim 1, Applicants require that only those packets in the sending node whose priority level equals of exceeds the feedback value sent by the receiving node will be sent to the receiving node over the link connecting the sending and receiving nodes.

Bustini describes a congestion control system for data networks. In the specification and drawings, Bustini discloses a multi-node network showing the transmission of an ICA signal from the downstream node to an upstream node. The upstream and downstream nodes are separated from each other by one or more intermediate nodes (see Bustini, col. 12, lines 20-23 and FIG. 7). The ICA signal is sent in anticipation of network congestion in bursty data queues of the network nodes. The ICA signal effectively initiates corrective action by controlling the rate at which each bursty node contributing to a congestion condition accepts incoming user data (see Bustini, col. 11, lines 12-20). The ICA signal controls a data flow rate; it does not set a threshold against which priority levels are measured. Data fields within each packet are not measured against the ICA signal. Nothing is measured against or compared with the ICA signal.

Bustini also discloses the use of separate queues for holding incoming traffic (see Bustini, col. 10, lines 1-5). These queues are associated with the traffic type field information, namely, high priority, voice, low speed statistical, high speed deterministic, bursty and multicast. Information stored in the traffic type field already exists in the incoming packet, *ab initio*. It is not set or changed by any node. This information is not used as an indicator of priority by Bustini, either expressly or implicitly. Further, the information in the traffic type field of an

incoming packet is not compared to any signal or value received by the upstream node from a downstream node.

Galand teaches an access control technology employing a backpressure signal for use in a switch. The backpressure signal is utilized to control the flow of traffic between a plurality of input ports on the switch and a plurality of output ports on the same switch (see Galand, col. 1, lines 7-13 and FIG. 1). A control element within Galand's switch communicates with the input and output ports in order to generate the backpressure signal. Galand shows no structure in which the backpressure signal is transmitted outside the one switch to another switch. Instead, Galand's structure is self-contained within that one switch or node.

Galand teaches the use of multiple queues within a single node, wherein each queue maintains packets having the same priority. When congestion control is invoked through the use of a backpressure signal, packets in high priority input queues are transferred into the output queues, followed possibly by packets in lower priority queues through the use of a spacing operation. If the high priority queues are empty, then packets in lower priority queues are transferred to the output queues by using the spacing operation from the outset until a backpressure signal or a high priority packet is received.

Galand does not compare a priority level of a packet to any feedback signal. Galand's only feedback signal is the backpressure signal labeled BP. It will be assumed in the following discussion that Galand's signal BP corresponds to Applicants' feedback value f_ℓ and that Galand's class priorities for RT signals, NRT signals, and NR signals correspond to applicants' priority level λ_p — it should be noted that Applicants' do not agree with any of these assumptions that have been proposed by the Examiner in the present Office Action. First, it is noted that Galand's backpressure signal BP is ultimately derived from the class priorities and signals based on memory usage as shown in the table for TABG(i,j), where i is the class priority and j is the memory usage information for the output port memories. As such, the backpressure signal value depends in part on and is derived in part from the class priority value. But there is no showing in Galand that the signal BP is compared in any way to the class priority value. Next, it should be noted that Galand defines the value of signal BP as a single bit having a value of 0 or 1, wherein traffic is allowed through to the output queue for BP=0 and all traffic flow to the output queue is denied for BP=1. Galand defines the values of his class priorities as 0 for

RT, 1 for NRT, and 2 for NR. Nowhere does Galand compare the value of BP and the class priority. But if Galand were to operate according to applicants' claimed invention, NR and NRT traffic would pass even when BP=1 because their priorities of that traffic (1 and 2, respectively) are greater than or equal to the value of signal BP. Instead, Galand fails to operate in any manner that is considered similar to Applicants' claimed method because Galand clearly prohibits all traffic flow, regardless of class priority, from the input queue to the output queue when BP=1, even though some classes of traffic have a priority equal to or greater than the value of signal BP.

The combination of Galand with Bustini is improper. Galand and Bustini deal with different structures. Bustini presents a multiple node structure in which packets and control signals are communicated between the nodes. Galand deals with a single switch (node) structure in which all control signals are contained solely within the single switch. If Galand and Bustini were combined, the combination would have the multiple node structure of Bustini in which each node assumed the structure of Galand. As such, the backpressure signal of Galand would remain internal to each node or switch rather than being communicated back from one node to another.

Applicants' claimed method is not taught, shown, or suggested by Bustini or Galand, separately or in combination. With respect to the second step of claim 1, nowhere do Bustini or Galand show a feedback value transmitted from the receiving node back to the sending node over the link that connects the two nodes together. If the ICA signal is a feedback value as suggested by the Examiner, and Applicants do not agree that it is, that signal is clearly not sent by the receiving node to the sending node over the link *l*. The link *l* is defined as connecting the sending node to the receiving node for downstream transmission of packets from the sending node per Applicants' claim 1. Bustini shows a multihop downstream connection and a single hop upstream connection between the sending and receiving nodes (see Bustini, FIG. 7). Bustini even indicates that more nodes, not fewer, may be intermediate the sending and receiving nodes so that the downstream connection includes many more hops. In that case, Bustini's ICA signal will be delivered to a sending node even farther away from the receiving node. With respect to Galand, the BP signal is not transmitted from node to node. Rather, it remains within a single switch as an intra-node signal not an inter-node signal. As a result, neither Galand nor Bustini,

separately or in combination, teach, show, or suggest the second step of Applicants' unique method as defined in claim 1.

With respect to the first step of claim 1, nowhere is it taught in Bustini or Galand that each packet in the sending node is assigned a priority level from a set comprising at least two priority levels. If priority levels were in fact Bustini's classes of service as pointed out by the Examiner in the present Office Action, and Applicants do not agree that they are, then Bustini fails to teach that packets in his service class are assigned that level or class by the sending node. Instead, packets are received into all nodes with the class of service already assigned. Similarly, in Galand, class priorities of 0 for RT, 1 for NRT, and 2 for NR are assigned to each packet prior to a packet's receipt at a network node. Neither Galand nor Bustini show any mechanism within their teachings for assigning a priority to a packet at the sending node. As a result, neither Galand nor Bustini, separately or in combination, teach, show, or suggest Applicants' unique method.

There is no teaching in Bustini that, if Bustini's service class were to be considered a "priority level" as suggested by the Examiner, the service class would be somehow compared to Bustini's ICA signal serving as a "feedback value" as also suggested by the Examiner in order to determine whether to send a packet downstream, as claimed by Applicants. Even the Examiner has expressly recognized that Bustini does not teach the last step of Applicants' claimed method.

As expressly noted by the Examiner in the present Office Action, the teachings of Galand have been added to Bustini in order to overcome the shortcomings of the Bustini reference with respect to the last step of Applicants' claimed invention. But even Galand does not show any comparison being made between the backpressure signal BP and Galand's class priorities to determine whether to send a packet from Galand's input queue to his output queue.

Even when Galand is combined with Bustini, it does not teach, show, or suggest Applicants' claimed invention. Galand and Bustini do not show any relationship between the signal sent to the sending node (ICA signal for Bustini; backpressure signal for Galand, both asserted by the Examiner) and priority levels for the transmitted packets. When Galand sets the backpressure signal BP=1, all traffic flow is prohibited even though there are two traffic types whose class priority equals or exceeds the value of the backpressure signal. If Galand were to operate in a manner similar to Applicants' claimed method, the two traffic types would be

allowed to transfer from the input queue to the output queue. Obviously Galand, neither expressly nor implicitly, performs any comparison between the class priority and the BP signal because Galand clearly prohibits all traffic flow, regardless of class priority, from the input queue to the output queue when BP=1, even though some classes of traffic have a priority equal to or greater than the value of signal BP.. Only Applicants define a method in which packets are transmitted downstream from the sending node to the receiving node when their "priority level λ_p equals or exceeds the feedback value f_ℓ," as set forth in claim 1.

Claim 12 presents all the same elements as claim 1 and adds a step of "periodically adjusting said feedback value f_ℓ and said priority level λ_p." Neither Bustini nor Galand teach a feedback value against which the packet priority level is measured and which is periodically adjusted. Bustini does not teach the adjustment of the priority level. While Bustini's reception of the ICA signal will cause the quiescent information rate to change, there is no indication that anything adjusts the value of the ICA signal, given that the Examiner has suggested that the ICA signal is Applicants' feedback value. Similarly Galand does not teach the adjustment of a class priority. As a result, neither Galand nor Bustini, separately or in combination, teach, show, or suggest Applicants' unique method as defined in claim 12.

In light of the reasons presented above with respect to independent claims 1 and 12, it is submitted that Applicants' claimed invention would not have been obvious to one having ordinary skill in the art at the time Applicants' invention was made upon a reading of Galand and Bustini, alone or in combination. As a result, claims 1 and 12 are believed to be allowable under 35 U.S.C. §103.

Claims 4, 5, 6, and 7 depend directly and indirectly from independent claim 1. These claims add further limitations to the method defined in claim 1. For the reasons set forth above with respect to independent claim 1, Applicants submit that dependent claims 4, 5, 6, and 7 are not obvious over the Bustini and Galand references. Accordingly, claims 4, 5, 6, and 7 are believed to be allowable under 35 U.S.C. §103.

B. Rejection over Bustini in view of Galand and Dally

The Examiner has rejected claims 9 and 13 as being unpatentable over the Bustini in view of Galand and further in view of U.S. Patent 4,933,933 issued to Dally (hereinafter referred to as "Dally"). The rejection is respectfully traversed.

The teachings of Bustini and Galand and the differences between those teachings and Applicants' claimed invention have been described in detail immediately above in Section III.A of the Remarks. Claim 9 defines a method having steps dealing with upstream transmission of a feedback value, priority level assignment, and conditional downstream transmission of packets. The differences between the related method steps as defined in claim 1 and the Galand and Bustini references have been discussed in detail already and are incorporated herein without repetition with respect to the steps in claim 1 related to steps in claim 9.

In the assigning step of claim 9, Applicants call for, "assigning a priority level λ_p to packets stored in the buffer of the receiving node R_ℓ such that all packets destined for the same destination have the same priority level." Neither Bustini, nor Galand, nor Dally, separately of in combination, teach, show, or suggest Applicants' unique claim limitation. Priorities, to the extent they are expressly taught by the references themselves or suggested by the Examiner, deal with the type of packets or class of service being employed in the systems described in each reference. There is no teaching or suggestion to have a priority level based on a packet destination "such that all packets destined for the same destination have the same priority level."

Bustini teaches number of hops, different rates, and different types of service, none of which constitute a priority level. Nowhere does Bustini teach that, "all packets destined for the same destination have the same priority level," as claimed by Applicants. It is understood that the Examiner agrees with this shortcoming in Bustini based on the statement in the second full paragraph on page 10 in the present Office Action.

Galand does teach priority levels, but those levels are set by the type of traffic, namely, real-time (RT), non-real-time (NRT), and non-reserved (NR). None of these priority levels has anything to do with the ultimate destination of the packet. Instead, the priority has everything to do with the data content of the packet. Nowhere does Galand teach that, "all packets destined for the same destination have the same priority level," as claimed by Applicants. It is understood

that the Examiner agrees with this shortcoming in Galand based on the statement in the second full paragraph on page 10 in the present Office Action.

Dally teaches deadlock avoidance. But Dally does not teach priorities based on having, "all packets destined for the same destination have the same priority level," as claimed by Applicants. Dally sets priorities based on two packet characteristics: a) the channel on which the packet arrives **and** b) the node to which the packet is destined. These characteristics are stated in the conjunctive and not in the disjunctive. It cannot be said that packets arriving at the same node and headed for the same destination will be assigned the same priority level because the priority level of Dally also takes into account the channel of arrival for a packet when setting the priority. There is no suggestion in Dally to set the priority on the basis of the destination alone, as claimed by Applicants. Thus, Dally, does not teach, show or suggest Applicants' step of priority assignment as defined in claim 9.

In light of the reasons presented above with respect to independent claim 9 and the earlier remarks concerning the differences between Applicants' claimed invention and the teachings of Galand and Bustini, it is submitted that Applicants' claimed invention would not have been obvious to one having ordinary skill in the art at the time Applicants' invention was made upon a reading of Galand and Bustini and Dally, alone or in combination. As a result, claim 9 is believed to be allowable under 35 U.S.C. §103.

Claim 13 depends directly from claim 9 and includes all the novel elements of the respective base claims as described above. In addition to all the novel elements defined in claim 9, claim 13 teaches, "assigning a priority level λ_ρ such that packets closer to their destination have a higher priority level." This concept is not found in Bustini or Galand. In Dally, there is a teaching that a packet's priority is always increasing as it moves closer and closer to its destination (see Dally patent, Abstract). But Dally fails to teach the underlying limitation from Applicants' claim 9, namely that, "all packets destined for the same destination have the same priority level," as discussed above.

In light of the reasons given above, it is respectfully submitted that neither Bustini nor Galand nor Dally, separately or in combination, teach, show, or suggest Applicants' invention defined by claim 13. Therefore, claim13 is believed to be allowable under 35 U.S.C. §103.

CONCLUSION

In view of the foregoing amendments and remarks, Applicants believe that this application is in condition for allowance. Reconsideration of this application and allowance are respectfully solicited.

If, however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, it is requested that the Examiner telephone Gregory C. Ranieri, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

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